4:00 p.m.

### 1211MP-168 Male-Specific Increase in the Prevalence of Atrial Fibrillation, 1976-94: The Copenhagen City Heart Study

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Background: Atrial fibrillation (AF) is associated with increased morbidity and mortality. Yet, there is a scarcity of data describing the prevalence of AF in the general population. With data from The Copenhagen City Heart Study we studied the secular changes in the prevalence of atrial fibrillation from 1976 to 1994 in a random population sample of persons aged 50-89 years.
Methods: The Copenhagen City Heart Study is a prospective population-based cohort study. The prevalence rates of AF, diagnosed from ECGs, were determined in 8,606 persons examined in 1976-78, 8,943 persons examined in 1981-83 and 6,733 persons examined in 1991-94. Changes in AF prevalence were estimated by using the generalized estimating equation method.
Results: 327 cases of AF were identified (76 cases in 1976-78, 102 in 1981-83 and 149 in 1991-94). In men, the age-standardized prevalence of AF increased from 1.4% in 1976-78 (OR: 1.0, reference value) to 1.9% in 1981-83 (OR: 1.6; 95% CI: 1.1-2.1) and to 3.3% in 1991-94 (OR: 2.3; CI: 1.6-3.4, p<0.0005, adjusted for age). In women, the age-standardized prevalence of AF tended to decrease with time from 1.4% in 1976-78 to 1.0% in 1981-83 and to 1.1% in 1991-94 (p=0.11). After adjusting for changes in predisposing conditions such as arterial hypertension, prior myocardial infarction, diabetes mellitus as well as body weight and height, the increase in the prevalence of AF in men remained significant (OR: 1.9; CI: 1.3-2.8, p=0.002).
Conclusion: The age-adjusted prevalence of AF in the male population more than doubled from 1976 to 1994, whereas no change occurred in women. The responsible factor(s) for the sex-specific increase in this common arrhythmia is yet to be identified.

4:12 p.m.

### 1211MP-169 Three-Dimensional Imaging of the Left Atrium and Pulmonary Veins: Computed Tomography or Magnetic Resonance Imaging?

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BACKGROUND: Three-dimensional (3D) imaging of the left atrium (LA) and distal pulmonary veins (PV) has proven valuable for pre and post-operative management of patients undergoing left atrial catheter ablation in the quest for control of atrial fibrillation. To achieve this goal, computed tomography (CT) and magnetic resonance imaging (MRI) have each been utilized. A direct comparison of these techniques has not been reported. METHODS: 22 patients referred for catheter ablation underwent both MRI and CT preoperatively (same day): CT: after an intravenous bolus injection of Optiray, multidetector CT (General Electric [GE] Lightspeed Plus) images were obtained during peak LA filling; MRI: after a bolus injection of gadolinium, MRI (GE Signa 1.5T LX-9.0) images were obtained during peak LA filling. For both CT and MRI, 3D image (intra and extraatrial vantages) reconstruction of source images was achieved using GE Advantage software. LA and PV dimensions, PV multiplicity and atriovenous junction morphologic detail were compared. RESULTS: For both techniques, proper timing of imaging after the contrast agent bolus was important; in this regard, although the task was more easily accomplished with CT, the gadolinium bolus could be repeated but the Optiray could not. Image acquisition time was significantly shorter with CT; this was correlated with better patient tolerance. Image processing times were similar. Characterization of LA and PV dimensions demonstrated no significant differences between imaging techniques. Characterization of PV multiplicity and individual atriovenous junction morphology was successfully achieved with both techniques, but the identification of dependent lung lobes was much more straightfoward with CT. Only CT permitted identification of pulmonary parenchymal abnormalities. CONCLUSIONS: For characterization of LA and PV anatomy, CT and MRI provided similar information. However, CT image acquisition was faster (cheaper), easier and better tolerated, and incidental but clinically important pulmonary parenchymal abnormalities were not uncommon. Based on these features, our current practice is to use CT in the absence of a contraindication to iodinated contrast.

4:24 p.m.

### 1211MP-170 Can the Left Atrial Appendage Be Safely Closed Without Removal?

David P. Krum, John Hare, Nicholas D. Georgakopoulos, Ryan Cooley, Masood Akhtar, Jasbir Sra, Aurora Sinai/St. Luke's Medical Centers, UW Medical School-Milwaukee Clinical Campus, Milwaukee, WI

**Background:** Closure of the left atrial appendage (LAA) may reduce the risk of thromboembolic events in patients with atrial fibrillation (AF). We tested the safety of LAA closure without removal in a chronic canine study. **Methods:** Following baseline transesophageal echocardiography (TEE), the left atrial appendage was closed using a staple (4 dogs) or tied (4 dogs), without removal. The dogs then recovered for three months. After the recovery period, the TEE was repeated, the animals were sacrificed and the atria were examined visually and histologically. **Results:** Eight dogs recovered for 91±4.1 days after LAA closure. At baseline, the mean LAA length and width were 3.21±0.31 and 1.79±0.21 cm respectively. The mean inward and outward flow velocities were 50.0±12.9 and 51.2±10.0 cm/sec respectively. Because the LAA was closed in all 8 dogs, the above parameters were not measurable upon follow-up. No thrombi were seen with TEE or during the necropsy. Scar tissue was seen on the endocardium covering the opening into the left atrial appendage. Necrotic or gangrenous tissue in the LAA was not observed. **Conclusion:** LAA closure without removal, using a minimally invasive approach such as thoracoscopy, may be a safe and effective way to reduce the risk of thromboembolic events in patients with AF who are not candidates for anticoagulation therapy.

4:36 p.m.

### 1211MP-171 Low Incidence of Pulmonary Vein Stenosis Following Ostial Pulmonary Vein Ablation

Ritsushi Kato, Lars Lickfett, Glenn Meininger, Timm Dickfeld, Ronald D. Berger, Henry R. Halperin, Hugh Calkins, Johns Hopkins Hospital, Baltimore, MD

Pulmonary vein (PV) isolation has been demonstrated to be a useful treatment for patients (pts) with paroxysmal atrial fibrillation (PAF). However, PV stenosis following catheter ablation is still an important complication, particularly when ablation is performed deep within the PV. The purpose of this study was to evaluate the characteristics and incidence of PV stenosis following ostial PV ablation.
Methods: Thirty pts with PAF underwent ostial PV ablation using an irrigated ablation system(Chili) with Lasso catheter guidance. All pts underwent gadolinium enhanced MRA prior to their procedure using 1.5 T MRI system and 20 pts also underwent 2 months F/U MRA. Three-Dimensional reconstruction images were taken using long axis oblique view of each PV for assessment of diameter reduction. A stenosis was defined as a narrowing of the PV diameter by greater or equal to 3 mm. The severity of stenosis was categorized as mild (<50%), moderate (50 - 70 %), or severe (> 70 %). Pulmonary vein stenoses were also classified as being concentric or eccentric.
Results: The incidence of PV stenosis was evaluated in 64 veins (20 patients). The resultant severity of stenosis when normalized to the pulmonary vein diameter was categorized as severe in one vein (RSPV,1.6%), moderate in one vein (LIPV, 1.6%), and mild in 14 veins (6 LSPV,4 RSPV, 3 LIPV, and 1 long left common trunk, 21.9%). The average length, minimum diameter and reduced diameter of narrowed segment were 15.4 ± 5.2 mm, 10.6 ± 3.1 mm, 5.2 ± 2.3 mm in patients with mild and moderate narrowings and 14 mm, 3 mm, 9 mm in the patient with a severe stenosis, respectively. An eccentric narrowing was seen in 6 veins and was usually distal to the pulmonary vein ostium. A concentric narrowing was seen in 10 veins and typically involved the ostium. All patients were asymptomatic and none required treatment.
Conclusions: The results of this study reveal that ostial PV ablation using an irrigated RF ablation system is associated with a low (<2%)incidence of moderate or severe PV stenosis. These results also confirm the value of MRA for monitoring for this complication following PV ablation procedures.

4:48 p.m.

### 1211MP-172 Markers of Inflammation, Myocardial Damage, and Tissue Healing After High-Energy Radiofrequency Ablation of Atrial Arrhythmias

Martina Brueckmann, Christian Wolpert, Thomas Bertsch, Tim Sueselbeck, Carlos Jaramillo, Michael Neumaier, Guenter Huhle, Martin Borggrefe, Karl K. Haase, University Hospital of Mannheim, Mannheim, Germany

Background: Radiofrequency ablation is associated with a localized endomyocardial necrosis, which may result in the release of biochemical markers of necrosis and inflammation. It was the aim of this study to determine the time-course of several markers of myocardial damage, inflammation and tissue reparation in patients before and after radiofrequency catheter ablation.
Patients and Methods: Blood samples were taken from 13 patients with atrial flutter (n=5), atrioventricular nodal reentry tachycardia (AVNRT; n=5) and Wolf-Parkinson-White syndrome (WPW; n=3) undergoing radiofrequency ablation. Blood was taken from a peripheral vein before ablation (day 0, baseline), at day 1 and 120 days after ablation. The proinflammatory marker interleukin-6 (IL-6) as well as metalloproteinase-9 (MMP-9), a marker for myocardial healing, were measured by Enzyme-linked immunosorbent assays (ELISA). Troponin I (TNI) and myoglobin, markers of myocardial damage, were determined by a heterogenous colorimetric immunoassay (TNI) or microparticle enzyme immunoassay (myoglobin). Statistical analysis was performed by student`s t-test for single comparisons. For multiple comparisons an analysis of variance was performed (ANOVA) followed by the Mann-Whitney-test.
Results: Levels of IL-6, TNI, myoglobin and MMP-9 were significantly elevated on day 1 after ablation compared to baseline levels before ablation (p< 0.05). Five of the 13 patients had cardiac troponin levels greater than the threshold of minor myocardial damage (>0.15µg/l). Whereas levels of IL-6 returned to basal levels after 120 days, the plasma level of MMP-9 was still elevated on day 120 compared to values before ablation (p=0.021).
Conclusion: Markers of inflammation, myocardial damage and wound healing are increased in patients who undergo radiofrequency ablation. MMP-9, a marker for myocardial healing is still elevated 120 days after the procedure, suggesting that radiofrequency ablation induces tissue damage leading to a long-term process of reparation.